CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

CONTENTS

Annexes

SECTION A. General description of project activity

A.1 Title of the project activity:

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Primavera Small Hydroelectric Project
PDD Version Number 04
13/11/2007

A.2. Description of the project activity:

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The Primavera Small Hydroelectric Project (hereafter, the "Project") developed by Eletro-Primavera Ltda.(hereafter referred to as the "Project Developer") consists of the installation of a small hydroelectric plant with an installed capacity of 18.2MW, located in Pimenta Bueno River, in the municipalities of Pimenta Bueno and Primavera de Rondônia, Rondônia State.

Although the installed capacity of the plant is 18.2MW and all calculations were done using this installed capacity, the project developer intent to do some tests in the existing equipments to upgrade the installed capacity. If the results of those tests show that no other new equipment is necessary and there is no damage possibility to the existing equipments, the installed capacity will be expanded to 20MW, resulting in a increase in the electricity provided to the grid and consequently in the amount of emissions reduction. This process is done only after the complete operation of the plant and is authorized by the electricity agency ANEEL. All supporting documents can be checked in the verification process.

The plant has the objective to provide renewable electricity to the municipalities of Pimenta Bueno, Espigão d'Oeste and Cacoal, in Rondônia State. The 24.4 km transmission line will be built by the project developer and will be connected to the Rondônia-Acre isolated system (hereafter referred to as "the Grid") through the municipality of Pimenta Bueno.

The grid is located in Rondônia and Acre States, in the Amazonian region. This is a very remote area, where the development of electricity supply infrastructure has been difficult. In most of the Amazonian region, the solution for the electricity supply problem, in the remote areas, has been the implementation of an isolated electricity system based on thermal power plants, fired by fossil fuels.

The plant will bring renewable electricity to develop this remote area both socially and economically, which has always been a difficult issue. This project will increase the supply of electricity to the grid, offsetting thermal generation with a renewable source of energy, all project emissions due to the reservoir will be accounted, even though the project will reduce CO_2e emissions. The power density of the proposed project will be 5.35 W/m², therefore project emissions must be accounted for. The calculation of project emissions can be found in section B.6.

The participants of the project recognize that this Project activity is helping Brazil to fulfil its goals of promoting sustainable development. Specifically, the project is in line with host-country specific CDM requirements due to the following reasons:

- Contributes to local environmental sustainability, since it decreases the dependence on fossil fuels, thus improving air quality.
- Contributes towards better working conditions and increases employment opportunities in the area where the project is located.
- Contributes towards better revenue distribution since it contributes to the regional/local economic development.
- Contributes development of technological capacity because part of the technology comes from developed countries (Germany), but the hand labour and technical maintenance will be provided inside Brazil, consolidating the technology in the country
- Contributes to regional integration and connection with other sectors. The project facilitates the increase of small hydroelectricity as a generating source in the region and therefore may encourage other similar companies that want to replicate this experience.

A.3. Project participants:

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Table 1 - Project participants

Name of party involved (*) ((host) indicates a host party)	Private and/or public entity(ies) Project participants (*) (as applicable)	Kindly indicate if the party involved wishes to be considered as project participant (Yes/No)
Brazil (host)	Eletro-Primavera Ltda.	No
The Netherlands	EcoSecurities Group PLC	No

(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time requesting registration, the approval by the Party(ies) involved is required.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

Brazil. (the “Host Country”)

A.4.1.2. Region/State/Province etc.:

Rondônia State.

A.4.1.3. City/Town/Community etc:

Pimenta Bueno and Primavera de Rondônia Municipalities.

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

The exact location of the project is defined using GPS coordinates 11°54'16"S 61°14'07"W.

A.4.2. Category(ies) of project activity:

According to Annex A of the Kyoto Protocol, this project fits in UNFCCC Sectoral Category 1: Energy Industries (renewable / non-renewable sources).

A.4.3. Technology to be employed by the project activity:

The project consists of a plant that generates renewable electricity to supply electricity to the grid. The hydro power plant has four sets of equipments. Each consists of one Brazilian horizontal Kaplan Tubular S type turbine (produced by HISA – Hidráulica Industrial S/A; the turbine axis is the only component that is produced outside Brazil, it came from Germany) and a Brazilian horizontal generators (type ATI, produced by GEVISA S/A). A Kaplan turbine is a propeller-type water turbine with adjustable blades.

Table 2 – Turbine technical description

Turbine Type	Kaplan Tubular S
Nominal Capacity	4.55 MW

Table 3 - Generator technical description

Generator Type	ATI
Nominal Power	5642kVA
Nominal Tension	6.9 KV

By legal definition of the Brazilian Power Regulatory Agency (ANEEL – *Agência Nacional de Energia Elétrica*), resolution number 652, issued on December 9th, 2003, small hydro in Brazil must have installed capacity greater than 1MW but not more than 30MW.

A low level diversion dam (height 14.5m) raises the water level of the river sufficiently to enable an intake structure to be located on the side of the river. The general arrangement of the diversion dam consists of the implementation of slide bar structures, a spillway and an adduction structure, lined up throughout the same axis, with total extension of about 610 m. A 138 kV transmission line (total distance 24.4 km – *Resolução 811/07*) from the switchyard to CERON sub-station at Pimenta Bueno is used for connect the plant to the grid.

The technology used in the project is environmentally safe and sound, for being a run-of-river power plant requiring for a minimum diversion dam, which store water to generate electricity for short periods of time; for instance, project's reservoir area is 3.4 km^2. The project power density is 5.35 W/m^2, in compliance the applicability condition of the methodology.

A.4.4 Estimated amount of emission reductions over the chosen crediting period:

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Table 4 - Estimated Emissions Reductions from the Project

Years	**Annual estimation of emission reductions in tonnes of CO2e**
2007(since September)	27,369
2008	82,109
2009	82,109
2010	82,109
2011	82,109
2012	82,109
2013	82,109
2014	82,109
2015	82,109
2016	82,109
2017(until August)	54,740
Total estimated reductions (tonnes of CO2e)	821,090
Total number of Crediting years	10
Annual average over the crediting period of estimated reductions (tonnes of CO2e)	82,109

A.4.5. Public funding of the project activity:

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The project will not receive any public funding from Parties included in Annex I of the UNFCCC.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the project activity:

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1. The baseline methodology: ACM0002: "Consolidated baseline methodology for grid connected electricity generation from renewable sources" version 06, in effect as of 19 May 2006;
2. The monitoring methodology: the approved consolidated monitoring methodology ACM0002:"Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources", Version 06 in effect as of 19 May 2006;
3. The tool for demonstration and assessment of additionality: the approved methodology of "the tool for demonstration and assessment of additionality", Version 03, in effect as of 16 February 2007 (EB29).

More information about the methodology can be obtained at:
http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

B.2 Justification of the choice of the methodology and why it is applicable to the project activity:

Table 5 - Applicability criteria as set out in the methodology

Criteria	Are the criteria met?	Justification
Applies to electricity capacity additions from: · Run-of-river hydro power plants; hydro power projects with existing reservoirs where the volume of the reservoir is not increased. · New hydro electric power projects with reservoirs having power densities (installed power generation capacity divided by the surface area at full reservoir level) greater than 4 W/m² · Wind sources; · Geothermal sources; · Solar sources; · Wave and tidal sources.	Yes	As the description in section A.4.3, the Project consists of a hydro power plant with a diversion dam and thus is in accordance with this requirement. According to Annex 5, EB 23, hydroelectric power plants with power densities greater than 4 but less than 10 W/m^2 can use current approved methodologies but have to use a default emission factor of 90 gCO_2eq/kWh
This methodology is not applicable to project activities that involve switching from fossil fuels to renewable energy at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;	Yes	The project consists in a construction of a new hydroelectric plant, therefore no fuel switch is applicable.
The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available	Yes	The plant is connected to the Rondônia-Acre Isolated System. All data necessary to calculate the grid emission factor was collected with CERON, a state company

		responsible for electricity distribution and regulation in Rondônia State and ELETRONORTE, a company subsidiary of Centrais Elétricas Brasileiras S/A – ELETROBRÁS, responsible for construction and operation of power plants and transmissions lines, and electricity generation and commercialization in the North Region of Brazil.
Applies to grid connected electricity generation from landfill gas capture to the extent that it is combined with the approved "Consolidated baseline methodology for landfill gas project activities" (ACM0001).	Not applicable	The project is a run-of-river hydroelectric project, thus this condition is not applicable.

The project activity meets all the conditions above and is therefore applicable to the methodology.

B.3. Description of the sources and gases included in the project boundary

The project boundary includes the Rondônia-Acre Isolated, the physical site of the plant as well as the reservoir area. For the baseline determination, were accounted only CO_2 emissions from electricity generation in fossil fuel fired power that is displaced due to the project activity.

The spatial extent of the project boundary includes the reservoir area, since the project power density is greater than 4 W/m² but less than 10 W/m².

The grid boundary is clearly defined as the spatial extent of the power plants that can be dispatched without significant transmission constraints. Specifically for this project the grid in question is the Rondônia-Acre Isolated System.

Table 6 - GHG included or excluded in the project boundary

	Source	Gas	Included?	Justification / Explanation
Baseline	Grid electricity production	CO_2	Included	According to ACM0002 only CO_2 emissions from electricity generation should be accounted for.
		CH_4	Excluded	According to ACM0002
		N_2O	Excluded	According to ACM0002
Project Activity	Hydro electric electricity production	CO_2	Included	According to Annex 5, EB 23, hydroelectric power plants with power densities greater than 4 but less than 10 W/m^2 have to use a default emission factor of 90 gCO_2eq/kWh to calculate project emissions.
		CH_4	Excluded	
		N_2O	Excluded	

B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

The project consists in a new electricity generation facility that will supply electricity to the grid. As stated in the methodology, for project activities that do not modify or retrofit an existing electricity generation facility, the baseline scenario is the following:

Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in section B.6.1.

The following table provides the key information and data used to determine the baseline scenario:

Table 7 - key information and data used to determine the baseline scenario

Variable	Unit	Data Source
Operating Margin Emissions Factor ($EF\_OM_{y,}$ in tCO_2/MWh)	tCO_2/MWh	ANEEL, Eletrobras S.A, ELETRONORTE and CERON
Build Margin Emissions Factor ($EF\_BM_{y,}$ in tCO_2/MWh)	tCO_2/MWh	ANEEL, Eletrobras S.A, ELETRONORTE and CERON
Baseline Emissions factor (EF_y)	tCO_2/MWh	ANEEL, Eletrobras S.A, ELETRONORTE and CERON

The technology employed in the baseline is the technology already used in the grid. Electricity generation in the grid is predominantly based on thermoelectric plants, internal combustion technology and diesel fueled, also one combined cycle thermoelectric plant, fueled by fuel oil. The other small part of the generation is provided by small power hydroelectric plants.

The baseline is defined as the Rondônia-Acre isolated system, it consists in 9 thermoelectric plants, adding 681.55 MW of installed capacity and 13 hydroelectric plants adding 259.50 MW of installed capacity. The electricity generation in the grid is about 55% thermoelectric, in average. The components of the grid, and thus of the baseline, are provided in the table below. For more details please see Annex 3.

Table 8 - Baseline components

Units	Type	Installed Capacity (MW)
Rio Branco	Hydro	6.90
Cabixi II	Hydro	2.80
Termonorte II	Thermal	349.95
Monte Belo	Hydro	4.80
PCH Altoe	Hydro	1.10
Alta F. D'Oeste	Hydro	5.00
PCH ST. Luzia	Hydro	3.00

Termonorte I	Thermal	68.00
PCH Cachoeira	Hydro	11.12
PCHs Castaman 2	Hydro	0.50
PCH Cabixi 1	Hydro	2.70
Rio Acre	Thermal	45.80
PCHs Castaman 3	Hydro	1.48
Rio Branco II	Thermal	32.40
PCHs Castaman 1	Hydro	1.50
Samuel	Hydro	216.00
PCH Rio Vermelho	Hydro	2.60
UTE Colorado	Thermal	10.95
UTE Vilhena	Thermal	23.75
Rio Madeira	Thermal	83.00
Rio Branco I	Thermal	18.10
Barro Vermelho	Thermal	49.60

All realistic and credible baseline alternatives to the project activity were identified and are listed below.

Scenario 1 Continuation of current practices, i.e. Electricity will continue to be generated by the existing generation mix operating in the grid, predominantly fossil-fuel-fired thermal plants;

Scenario 2 Build a thermoelectric plant, with internal combustion technology, diesel fueled and with a energy output similar to project activity and;

Scenario 3 The Project Activity not taken as a CDM project.

According to the full assessment of alternatives alternative 1 is identified as the baseline scenario.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):

General Context:

According to the audit report from the Brazilian Court of Audit (2004), the Brazilian Electricity System mainly consists in an interconnected system that includes South, Southeast, Middle-West, Northeast and part of the North Regions. Rondônia State, a very remote area, is not connected to those systems. The connection is difficult, since building and maintaining transmission lines in the middle of the rain forest is complex and expensive. Power sources must be built near the user. Thus the solution for the problem, in order to minimize electricity supply risks in this remote area, has been the implementation of isolated electricity systems, based on thermal power plants, fired by fossil fuels.

In order to promote the development of the north region, in 1993 the Brazilian Government came up with a law - 8631/93 - that obliged all energy concessionaires to divide proportionally the costs of fossil fuel (diesel or fuel oil) consumed on isolated systems at the north region. Therefore, supplying electricity to that region, with reasonable price. This obligation is called CCC -"Conta Consumo de Combustíveis", meaning Fuel Consumption Account.

Besides CCC, the government also created the CCC Subrogation in 1999 (law no. 9648/98). This policy was implemented because CCC only applied to electricity generation from thermal units fired by fossil fuels. The CCC subrogation now says that renewable energy can also apply for the subsidy. Therefore, the subrogation of CCC resources facilitates the replacement of fossil fuel consumption by other alternative and renewable sources, as for example, hydro energy (Tolmasquim, 2004).

CCC Subrogation could represent an attractive incentive: according to ANEEL (National Electricity Agency), for the implementation of new generation unit the construction can be subsided from 50% to 75% and the internal rate of return for those investments can increase considerably. However, there are still two main obstacles involved in the CCC Subrogation that will be better described below, specifically considered in this project.
Those two laws were created in order to promote the development of isolated regions at north Brazil, by supplying electricity at a lower price for the end user. Otherwise, electricity prices to justify the electricity generation would be much higher than the local population could afford.

In spite of those subsides, according to "ANEEL CCC + CCC subrogation utilization guide" it should be created other legal devices to help changing the source of energy from fossil to renewable, in which the Kyoto Protocol is suggested as an alternative.

This scenario faces specific financial/economic barriers due to the fact that even receiving the subsidies from the CCC Subrogation; this scenario faces two important obstacles, quoted from the Brazilian Court of Audit (2004).

Even with the existence of the CCC sub rogation subside, as quoted from the Brazilian Court of Audit, 2004, there is "lack of interest, from energy concessionaires, to lose the guaranteed CCC resources in order to support generation investments on the basis of alternative sources. Moreover, the North Region concessionaires present unfavourable economic financial situation. This conjuncture brings unreliability to the investors of the generation area related to capital spending in renewable sources projects…" (Translated from Brazilian Court of Audit, 2004, paragraph 113).

Laws and regulations are different in isolated systems. The main difference between isolated and interconnected systems is the pattern of electricity generation. Interconnected systems are characterized by the participation of private entities, while in isolated systems the government still remains as the dominant provider. In interconnected systems functioning is based in three institutions: ONS, the system operator and body responsible for optimization, coordination, control and operation of the system; ANEEL the national electricity agency, responsible for inspection and regulation of production, transmission, distribution and commercialization of electricity; and MAE, the electricity wholesale market, where electricity transactions are made, based on a spot market and regulated by ANEEL. All market transactions are made at auctions. In 1994, to succeed the MAE, the CCEE (Câmara *de Comércio de Energia Elétrica* – Electricity Energy Commercialization Chamber) was created, and is responsible, inter alia, for MAE's actions. Rondônia-Acre system is not interconnected, thus the generation, distribution and commercialization characteristics are different to those of the main interconnected grids, and are mainly based in state model.

In conclusion, those isolated systems have a particular pattern of regulation, totally different from the connected systems. Such isolated systems are unlikely to be connected to the main grid because the interconnection is difficult for the reasons outlined above.

The determination of project scenario additionality is done considering the general context described above and using latest version of the "Tool for the demonstration and assessment of additionality" agreed by the Executive Board, which follows the following steps:

Project participants wish to have the crediting period starting after to the registration of their project activity. In spite of that, the communication between the project developer and the carbon consultants started before the project start operation and before start crediting period. One of the shareholders of the project developer is also a shareholder of another CDM project activity ("Incomex Hydroelectric Project") which has been in development since 2000, and therefore CDM was seriously considered since the year 2000, before the implementation of the project.

As will be shown in Step 2 below, the project is unlikely to move forward without the additional financial support. The additional revenue generated by carbon sales would be very important to make the project go ahead, since the project NPV with carbon revenues became positive, see Table 9 below. Even though with carbon revenues, the NPV, under current carbon prices, being positive, CDM participation brings numerous other attendant benefits, including reduced currency risks due to the fact that CDM revenue is gained in US$, enhanced international participation in the project, international publicity of the project and recognition of its environmental benefits, and the added prestige associated with a CDM project activity.

Table 9 - Financial analysis considering carbon credits revenues

Analysis with Carbon Revenues		
NPV with Carbon Credits	R$	7,153,931.13
NPV without Carbon Credits	R$	(9.593.988,99)

Step 1. Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a. Define alternatives to the project activity:

All realistic and credible baseline alternatives to the project activity were identified and are listed below.

Scenario 1 Continuation of current practices, i.e. Electricity will continue to be generated by the existing generation mix operating in the grid, predominantly fossil-fuel-fired thermal plants;

Scenario 2 Build a thermoelectric plant, with internal combustion technology, diesel fueled and with a energy output similar to project activity and;

Scenario 3 The Project Activity not undertaken as a CDM project.

Sub-step 1b. Enforcement of applicable laws and regulations:

Scenario 1 – Is consistent with current laws and regulations. There is no regulation in Brazil to prevention of continuation of current practice.

Scenario 2 – Is consistent with ANEEL laws and regulations. There is no regulation in Brazil to prevent implementation of thermoelectric plants.

Scenario 3 – Is consistent with ANEEL laws and regulations. There is no regulation in Brazil to prevent implementation of hydroelectric plants.

Step 2. Investment Analysis

Sub-step 2a: Determine appropriate analysis method

According to the tool for the demonstration and assessment of additionality, one of three options must be applied for this step: simple cost analysis (where no benefits other than CDM income exist for the project), investment comparison analysis (where comparable alternatives to the project exist) or benchmark analysis.

Option three was chosen (benchmark analysis).

Sub-step 2b: Option III - Apply benchmark analysis

The Net Present Value (NPV) will be used as the most appropriate financial indicator for comparison. The NPV places a valuation, in terms of present value, of the future income associated to a project or investment alternative, i.e. it measures the present value of cash flows generated by the project. The decision to go ahead with the project is done if the NPV is positive. A positive NPV generates value to the company and a negative NPV represents a loss to the company.

In order to perform a benchmark analysis using NPV, a discount rate must be chosen. The basis for the selected discount rate used in the financial analysis is the SELIC rate (Sistema Especial de Liquidação e Custodia, that is, Special System of Clearance and Custody), set by the Banco Central do Brasil (Central Bank of Brazil) which represents the expected return of a low risk investment fund[1]. Results with negative NPV means that the investment return is lower than the discount rate, thus lower than the return from a low risk investment. Positive NPV represents a return higher than a conservative investment. Scenarios with a negative NPV presents significant financial/economical barrier. In 2002, the year when

[1] Central Bank of Brazil http://www.bcb.gov.br/?SELICEN

the decision to invest in the project activity was taken, the SELIC rate oscillated between 14.01% and 18.99% (Brazil Central Bank, http://www.bcb.gov.br/?english). In order to be conservative, 12% has been taken as a reference value for the sensitivity analysis.

Sub-step 2c: Calculation and comparison of financial indicators

Table 10 below shows the financial analysis for the project activity without carbon finance. As shown, the project NPV without carbon is negative, proving that the Project is not attractive for investors, what inhibits the project's implementation. The cash flow analysis was done for 12 years period, this is the average length of loans in the electric sector.

Table 10– Project Financial Results

Parameter	unit	value	Source
Investments	R$	55,401,567.00	ANEEL
Installed Capacity	MW	18.20	ANEEL
Electricity Tariff	R$/MWh	76.00	PPA
Electricity generation	MWh/year	96,360	PPA
O&M Costs	R$/MWh	36.54	Project developer
CCC Sub Rogation	%	75%	ANEEL
Discount Rate	%	12.00%	SELIC
Depreciation	%	3.33%	Calculated
NPV without Carbon Credits	R$	-9,593,989	Calculated

Sub-step 2d: Sensitivity analysis

A sensitivity analysis was conducted by altering the following parameters:

- O&M costs reduction;
- Discount rate reduction;
- Investment reduction and;
- Electricity tariff increase.

Those parameters were selected as being the most likely to fluctuate over time. Financial analyses were performed altering these parameters by 10% and assessing what the impact on the project NPV would be (see Table 11 below).

Table 11 - Sensitivity analysis summary

Parameter	Variation	NPV
O&M costs	-10%	(R$ 8,191,384.19)
Discount Rate	-10%	(R$ 7,321,378.08)
Investments	-10%	(R$ 7,021,600.66)
Electricity Tariff	10%	(R$ 3,492,592.90)

The financial analysis shows that even if the critical parameters are varied more than expected, the NPV of the project is still negative and therefore not financially attractive for a rational investor.

Step 4. Common Practice Analysis

Sub-step 4a: Analyse other activities similar to the proposed project activity

The additionality tool specifies that projects are considered similar if "they occur in the same country/region". For this Project an analysis of similar activities in the isolated systems from North Region of Brazil is considered to be the most appropriate, as investment conditions, and some regulatory requirements, tend to be similar in those systems rather than by regional areas.

Table 12 - Isolated Systems Configuration in 2006 (sources: Eletrobras)

	Number of units		Installed Capacity (MW)	
	Hydro	Thermal	Hydro	Thermal
Rondônia (all plants)	26	153	262.574	701.464
All Isolated Systems in Brazil	61	1,443	628.549	3,391.543

Table 12 above includes all information about the isolated systems, including an analysis for all electricity generation plants in Rondônia State, where the project is located, and an analysis for all Isolated Systems in Brazil. Table 13 shows the same data in percentage form. All information was taken from the Operational Plan for 2006, a public report issued by ELETROBRÁS. To analyse similar activities, all Hydro and Thermal Power Stations that are operating in the Isolated Systems were selected.

Sub-step 4b: Discuss any similar options that are occurring

As shown by the information provided above, generating electricity in hydroelectric plants is not a common activity in Rondônia State and in the Isolated Systems from the North Region of Brazil. Hydro Power Stations comprise a small part of the installed capacity of Rondônia and of the entire Isolated Systems.

Table 13 – Thermal and Hydro participation in Rondonia, and in all Isolated Systems in Brazil, 2006 (source: Eletrobras)

	Number of units		Installed Capacity (MW)	
	Rondônia	All	Rondônia	All
Total	179	1,504	964.038	4,020.092
Hydro	14.53%	4.06%	27.24%	15.64%
Thermal	85.47%	95.94%	72.76%	84.36%

Thermal electricity installed capacity and generation inside isolated systems has historically increased since 2001 until 2006. According to the Operational Plan for 2003 (ELETROBRAS), forecasted hydro generation corresponded to 2,048 GWh, while thermal generation corresponded to 6,991 GWh. Furthermore, according to this same plan, thermal generation was projected to increase by 9% and hydro generation to decrease by 5%. Still, in the Operational Plans for 2004 and 2005, a comparison between thermal and hydro generations indicates a clear predominance of thermal generation. Analysing the Operational Plan for 2006, thermal installed capacity remains higher than hydro installed capacity, and comparing with the report from 2005 thermal installed capacity increased by 7.76%, while hydro installed capacity decreased 3.83%. Figure 1 below illustrates the installed capacity trends in Rondônia. Is clearly shown that thermal installed capacity has tended to increase, while hydro installed capacity has tended to be almost constant, between 2004 and 2006.

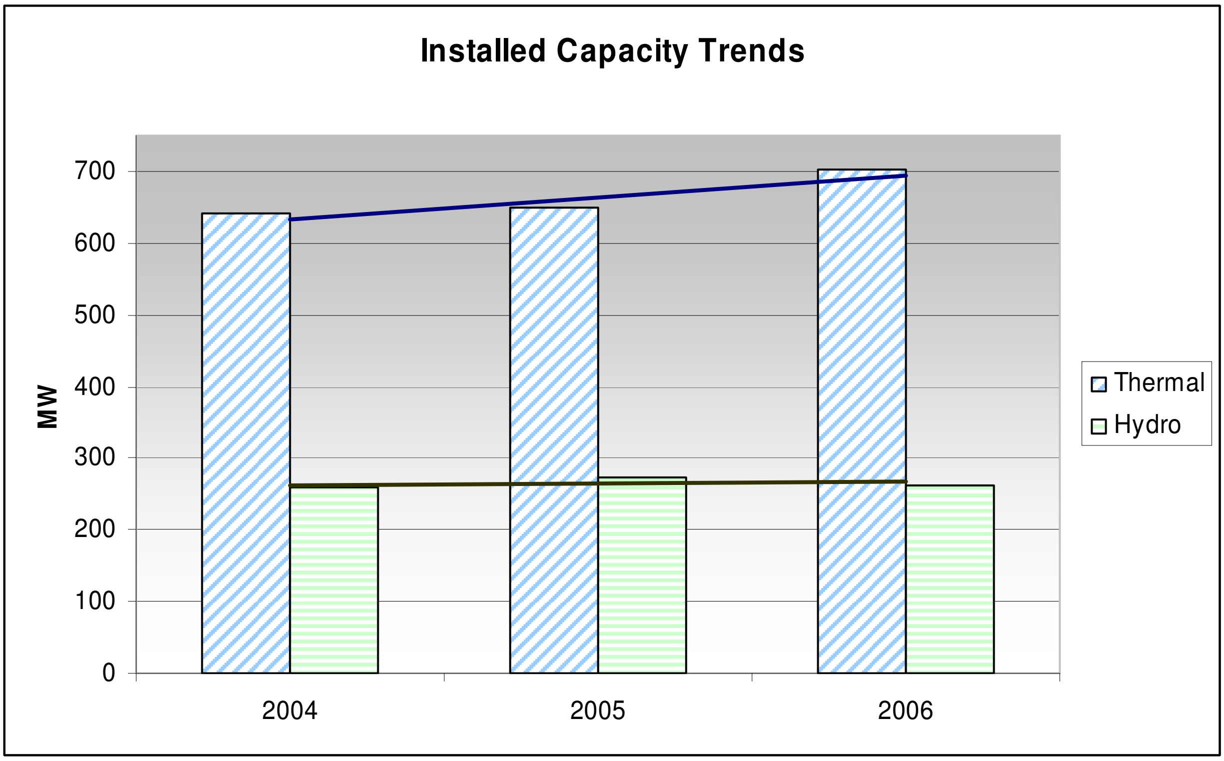


Figure 1 - Installed capacity trends in Rondônia (Souces: Eletrobrás – own elaboration)

Therefore, based on these data, it is clearly demonstrated that the prevailing practice in terms of energy generation and installed capacity in Rondônia is predominantly thermal and, consequently, the trend in the region is the construction of thermal units using fossil fuels rather than the construction of hydro units.

All steps of the Tool for the demonstration and assessment of additionality were satisfied, thus the project is additional to what would have occurred in absence of the project activity.

B.6 Emission reductions

B.6.1. Explanation of methodological choices:

Step 1 – Calculate the Operating Margin emission factor: the calculation was based on the simple OM method, option (a) of the methodology. This method was selected because low-cost/must run resources5 constitute less than 50% of total grid generation in average of the five most recent years. For more information please see Annex 3.

The OM was calculated *ex-ante*, using the full generation-weighted average for the most recent 3 years for which data are available at the time of PDD submission.

The Simple OM emission factor ($EF_{OM,simple}$) is calculated as the generation-weighted average emissions per electricity unit (tCO_2/MWh) of all generating sources serving the system, not including low-operating cost and must-run power plants:

$$EF_{OM,simple} = \frac{\sum_{ij} F_{ij} \cdot COEF_{ij}}{\sum_{j} GEN_{j}} \quad (1)$$

Where,

F_{ij} is the amount of fuel *i* (in GJ) consumed by power source *j* in year *y*;

j is the set of plants delivering electricity to the grid, not including low-cost or must-run plants and carbon financed plants;

$COEF_{i,j}$ is the carbon coefficient of fuel *i* (tCO_2/GJ);

GEN_j is the electricity (MWh) delivered to the grid by source *j*.

Step 2 – Calculate the Build Margin emission factor: the calculation was done as the generation-weighted average emission factor (tCO_2/MWh) of a sample of power plants *m*, as follows:

$$EF_{BM} = \frac{\sum_{im} F_{im} \cdot COEF_{ij}}{\sum_{m} GEN_{m}} \quad (2)$$

Where $F_{i,m,y}$, $COEF_{i,m}$ and $GEN_{m,y}$ are analogous to the variables described for the simple OM method above, for plants *m*. This sample includes either the last five plants built or the most recent plants that combined account for 20% of the total generation, whichever is greater (in MWh). From these two options the sample group that comprises the larger annual generation is the five most recent plants.

The option 1 of the methodology was chose to calculate the Build Margin emission factor *ex-ante* based on the most recent information available on plants already built for sample group m at the time of PDD submission.

Step 3 – Calculate the baseline emission factor: the calculation was done as the weighted average of the Operating Margin emission factor and the Build Margin emission factor:

$$EF = w_{OM} \cdot EF_{OM,simple} + w_{BM} \cdot EF_{BM} \quad (3)$$

where the weights w_{OM} and w_{BM}, by default, are 50% (i.e., $w_{OM} = w_{BM} = 0.5$), and $EF_{OM,y}$ and $EF_{BM,y}$ are calculated as described in Steps 1 and 2 above and are expressed in tCO_2/MWh.

Project Emissions: (*PE*)

According to Annex 5, EB 23, hydroelectric power plants with power densities greater than 4 but less than 10 W/m^2 have to account for project emissions due to the reservoir. Project power density is 5 W/m^2, thus a default emission factor of 90 gCO_2eq/kWh is used to estimate project emissions.

$$PE_y = \frac{EF_{res} \cdot EG_y}{1000} \quad (4)$$

Where:

PE_y Emissions from reservoir expressed as tCO_2e/year

EF_{res} is the default emission factor for emissions from reservoirs, and the default value as per EB23 is 90 Kg CO_2e /MWh.

EG_y is the annual net electricity generated from the Project and delivered to the grid

Baseline Emissions: (*BE*) resulting from the electricity supplied and/or not consumed from the grid is calculated as follows,

$$BE = EG_y \cdot EF \quad (5)$$

Where,

EG_y is the annual net electricity generated from the Project and delivered to the grid

Leakage Emissions: (*L*) no leakage emissions calculation is needed.

Emission Reductions: (*ER*)

$$ER = BE - PE \quad (6)$$

B.6.2. Data and parameters that are available at validation:

Data / Parameter:	$EF_{OM, simple}$
Data unit:	tCO_2/MWh
Description:	Grid Operating Margin
Source of data used:	ELETROBRAS S.A., ANEEL, ELETRONORTE, CERON and IPCC, 2006
Value applied:	0.8682
Justification of the choice of data or description of measurement methods and procedures actually applied :	OM is calculated according to option (a) Simple OM method of methodology ACM0002. For further information please refer to Annex 3.
Any comment:	

Data / Parameter:	w_{OM}
Data unit:	Fraction
Description:	Weighting
Source of data used:	ACM0002
Value applied:	0.5
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default weighting value for Operating Margin taken from ACM0002
Any comment:	

Data / Parameter:	EF_{BM}
Data unit:	tCO_2/MWh
Description:	Grid Build Margin
Source of data used:	ELETROBRAS S.A., ANEEL, ELETRONORTE, CERON and IPCC
Value applied:	1.0160
Justification of the choice of data or description of measurement methods and procedures actually applied :	BM is calculated according to methodology ACM0002. For further information please refer to Annex 3.
Any comment:	

Data / Parameter:	w_{BM}

Data unit:	Fraction
Description:	Weighting
Source of data used:	ACM0002
Value applied:	0.5
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default weighting value for Build Margin taken from ACM0002
Any comment:	

Data / Parameter:	**EF_y**
Data unit:	tCO_2/MWh
Description:	Grid emission factor. Is the CO_2 emissions intensity of the electricity displaced in the grid
Source of data used:	ELETROBRAS S.A., ANEEL, ELETRONORTE, CERON and IPCC, 2006
Value applied:	0.9421
Justification of the choice of data or description of measurement methods and procedures actually applied :	The Baseline Emission Factor calculation consists of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the approved methodology ACM0002. Detailed information is attached in Annex 3.
Any comment:	

Data / Parameter:	Area submerged
Data unit:	km^2
Description:	Surface area of the reservoir
Source of data used:	Dispach number 413, issued on 10/07/2003 by ANEEL
Value applied:	3.4
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

All equations used to estimate the emission reductions were provided in section B.6.1. The grid emission factor was calculated using equations 1, 2 and 3, according to the description provided in the

methodology. Project emissions, equation 4, Baseline emissions, equation 5 and emissions reduction calculations, were done also according to the methodology.
Detailed information of how the equations were used, and values applied are provided in Table 14.

Table 14 - The ex-ante emission reductions values and calculations

Parameter	Formula	Value	Unit
BM	provided in section B.6.1	1.0160	tCO_2/MWh
wBM	-	0.5	-
OM	provided in section B.6.1	0.8682	tCO_2/MWh
wOM	-	0.5	-
EF	provided in section B.6.1	0.9421	tCO_2/MWh
Installed_capacity	-	18.20	MW
EG	-	96,360	MWh
Reservoir_area	-	3.4	km²
Power density	= Instaled_capacity/Reservoir_area	5.35	MW/km²
BE	= EG * EF	90,781	tCO_2e
PE	= EF_{res} * EG / 1000	8,672	tCO_2e
ER	= BE - PE	82,109	tCO_2e

B.6.4 Summary of the ex-ante estimation of emission reductions:

Table 15 - Ex-ante estimation

Years	Estimation of project activity emissions (tonnes of CO_2e)	Estimation of baseline emissions (tonnes of CO_2e)	Estimation of leakage (tonnes of CO_2e)	Estimation of emission reductions (tonnes of CO_2e)
2007(since September)	2,891	30,260	0	27,369
2008	8,672	90,781	0	82,109
2009	8,672	90,781	0	82,109
2010	8,672	90,781	0	82,109
2011	8,672	90,781	0	82,109
2012	8,672	90,781	0	82,109

2013	8,672	90,781	0	82,109
2014	8,672	90,781	0	82,109
2015	8,672	90,781	0	82,109
2016	8,672	90,781	0	82,109
2017(until August)	5,781	60,521	0	54,740
Total (tonnes of CO_2e)	86,720	907,810	0	821,090
Average	8,672	90,781	0	82,109

B.7 Application of the monitoring methodology and description of the monitoring plan:

B.7.1. Data and parameters monitored:

Data / Parameter:	EG_y
Data unit:	MWh
Description:	Net electricity delivered to the grid
Source of data to be used:	Project developer and CERON
Value of data applied for the purpose of calculating expected emission reductions in section B.5	96,360 MWh (Reference electricity generation from PPA)
Description of measurement methods and procedures to be applied:	Data collected will be the continuous reading from the plant meters and the monthly reading from the utility meter (SAGA1000 - model 1681, the accuracy is ±0.2% (from the equipment manual). The utility monthly reading is used for issuing the electricity sale invoices (this document will show the amount of energy supplied to the grid).
QA/QC procedures to be applied:	According to national standards, equipment will be subject to a regular maintenance, calibration and testing regime to ensure accuracy. Collected data has low uncertainty levels and to guarantee its accuracy it will be cross checked with the electricity sales receipts obtained from the grid operator.
Any comment:	Data will be archived at least for two years after crediting period.

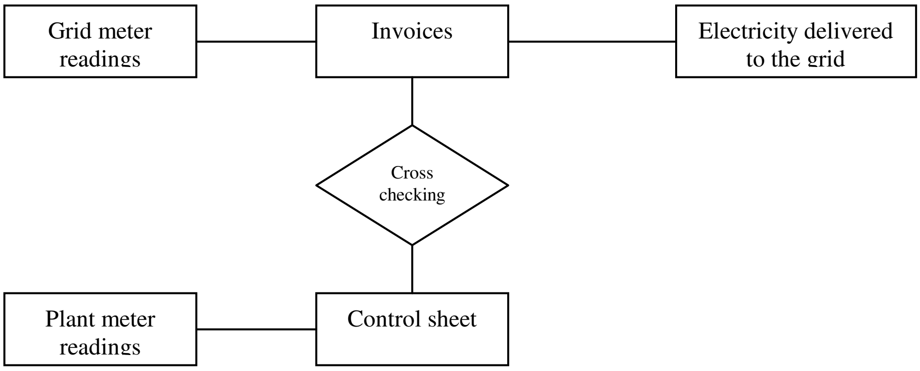
B.7.2 Description of the monitoring plan:

The monitoring of this type of project consists of metering the electricity generated by the renewable technology. Below you find the description of monitoring procedures for data measurement, quality assurance and quality control.

1. Monitoring organisation

The grid operator reads the meter in a monthly basis and this data will be used by the project developer to issue electricity sale invoices. Those invoices contain the amount of electricity delivered to the grid and will be used to calculate the amount of CERs generated from the project activity.

Power plant operators read, in an hourly basis, the gross electricity generated, in order to control the plant operation. These readings are also used to check the consistency of the amount of electricity stated in the invoices read by the grid operator.



Metering of Electricity Supplied to the Grid

The main electricity meter for establishing the electricity delivered to the grid will be installed at the grid end of the transmission line. This electricity meter will be the revenue meter to measure the quantity of electricity that the project will be paid for. As this meter provides the main data for CER measurement, it will be the key part of the verification process.

Data will also be measured continuously by the plant operator and at the end of each month the monitoring data will be filed electronically and a back-up will be made regularly. The project developer will keep the electricity sale invoices. Data will be archived electronically and on paper and will be kept for at least two years after the crediting period.

The electricity meter should meet relevant local standards at the time of installation. The meter will be installed by either the project developer or the grid company in accordance with Brazilian standards, established by INMETRO *(“Instituto Nacional de Metrologia, Normalização e Qualidade Industrial”*- entity responsible for calibration standards) and by ANEEL (*Agencia Nacional de Energia Elétrica* – The Electricity National Agency. Records of the meter (type, make, model and calibration documentation) will be retained in the quality control system.

Quality Control and Quality Assurance

Quality control and quality assurance procedures will guarantee the quality of data collected. The electricity meter(s) will undergo maintenance subject to industry standards. Moreover, meter(s) are calibrated by the distribution concessionaire CERON - which signs a long term PPA with the plants - in accordance with national standards established by INMETRO *("Instituto Nacional de Metrologia, Normalização e Qualidade Industrial"*- entity responsible for calibration standards) and recalibrated according to CERON internal procedures or manufacturer specifications. Documents will be available during the verification.

To guarantee the consistency and accuracy of the data collected from the meter(s), data will be cross-checked with the sale invoices which will show the amount of electricity supplied to the grid.

Before the crediting period starts, the organisation of the monitoring team will be established and clear roles and responsibilities will be assigned to all staff involved in the CDM project.

Data will be read off the meter and energy sale invoices s will be collected from the small hydro by the plant operation personnel. This information will be transferred to EcoSecurities on a monthly basis in order to monitor emission reductions.

The energy generating equipment will not be transferred from another activity; therefore, leakage effects do not need to be accounted.

B.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

>>

The baseline study and the monitoring methodology were concluded on 27/12/2006. The entity determining the baseline study and the monitoring methodology and participating in the project as the Carbon Advisor is EcoSecurities Group PLC, listed in Annex 1 of this document.

Leandro Noel
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SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

27/12/2002

C.1.2. Expected operational lifetime of the project activity:

30 years

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

Not applicable

C.2.1.2. Length of the first crediting period:

Not applicable

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

01/09/2007

C.2.2.2. Length:

10 years – 0 months

SECTION D. Environmental impacts

D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

The Project generates no emissions of greenhouse gases and produces no toxic waste, and has limited, controlled and reversible effects on the environment because the project is a run of river small hydro, using water directly from the river with a small storage area designed only to allow the water intake to operate. The project has easy integration in the landscape and has compatibility with the protection of water, fauna and flora.

As for the regulatory permit, the project developer has authorization to operate as an independent power producer issued by ANEEL (ANEEL Resolution nº 747, issued on 18/dez/2002), and received authorization to operate the Project on 24/07/2003 (ANEEL Dispatch nº 465).

As for the environmental permits, the project has the necessary environmental licenses. The license of operation was issued by the state environmental agency, NUCOF/SEDAM, LO number 0002869 issued on 12/12/2006.

A PCA (Environmental Control Plan) was developed in order to identify and undertake ultimate environmental impacts due to the project activity. Regarding the PCA, the project activity has no significant negative impacts to the environment, offering overall benefits to the local society; moreover, the PCA analyzes the undertaking in environmental perspectives, identifying and assessing the possible environmental impacts and listing its mitigation actions.

Also, a PRDA (Program for Recovering of Degraded Areas) and a Monitoring Plan was developed with the purpose to analyse and address eventual negative impacts derived from the project activity. According to the PRDA the environmental impacts have occurred before the implementation of the project, due to rural activities. The impacts due to the project are not significant and recovery actions have been done.

All documents related to operational and environmental licensing are public and can be obtained at the state environmental agency.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

The project is already in operation under the approval of the environmental agency, NUCOF/SEDAM, and the environmental impacts are not significant.

SECTION E. Stakeholders' comments

E.1. Brief description how comments by local stakeholders have been invited and compiled:

According to Resolution #1 dated December 2nd, 2003 from the Brazilian Inter-Ministerial Commission of Climate Change (Comissão Interministerial de Mudança Global do Clima -CIMGC), any CDM project must send a letter with a description of the project and an invitation for comments by local stakeholders. In this case, letters were sent to the following local stakeholders:

- City Hall of Primavera de Rondônia and Pimenta Bueno ;
- District Attorney (known in Portuguese as Ministério Público, i.e. the permanent institution essential for legal functions responsible for defending the legal order, democracy and social/individual interests);

- Chamber of Deputy of Primavera de Rondônia and Pimenta Bueno;
- SEDAM Porto Velho;
- Brazilian Fórum of NGOs
- Environmental Agency of Primavera de Rondônia and Pimenta Bueno
- Local community associations

Local stakeholders were invited to raise their concerns and provide comments on the project activity for a period of 30 days after receiving the letter of invitation.

Although project proponents looked for local community associations, those were not found. Therefore Project proponents will justify this situation to the Brazilian DNA.

E.2. Summary of the comments received:

One Stakeholder, the Brazilian Fórum of NGOs, raised a comment on February 16th, 2007, to the project suggesting the use of the Gold Standard certificate.

E.3. Report on how due account was taken of any comments received:

The comment was assessed and accounted to the project, however no modification was necessary to the PDD.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

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Represented by:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

This project will not receive any public funding from Annex 1 parties.

Annex 3

BASELINE INFORMATION

The financial analysis was done for a 12 year period. Detailed information for the financial analysis is provided below.

PRIMAVERA SHP	UNIT	Value	0	1	2	3	4	5	6	7	8	9	10	
INVESTMENTS														
Total Investments	R$	55,401,567.00	55,401,567.00											
REVENUES														
Installed Capacity	MW	18.2												
Load Factor	%	60%												
Electricity Generation	MWh	96,360												
Electricity Tariff	R$/MWh	76.00												
Income	R$	7,323,360.00		7,323,360.00	7,323,360.00	7,323,360.00	7,323,360.00	7,323,360.00	7,323,360.00	7,323,360.00	7,323,360.00	7,323,360.00	7,323,360.00	7
CCC Subrogation	%	75%												
Number of installments	number	11.00												
CCC Subrogation revenues	R$	3,875,847.33		3,875,847.33	3,875,847.33	3,875,847.33	3,875,847.33	3,875,847.33	3,875,847.33	3,875,847.33	3,875,847.33	3,875,847.33	3,875,847.33	3
Total Revenues	R$			11,199,207.33	11,199,207.33	11,199,207.33	11,199,207.33	11,199,207.33	11,199,207.33	11,199,207.33	11,199,207.33	11,199,207.33	11,199,207.33	11
O&M COSTS														
Unitary Costs	R$/MWh	36.54												
Total Costs	R$	3,520,716.47		3,520,716.47	3,520,716.47	3,520,716.47	3,520,716.47	3,520,716.47	3,520,716.47	3,520,716.47	3,520,716.47	3,520,716.47	3,520,716.47	3
Depreciation	%	0.03		1,846,718.90	1,846,718.90	1,846,718.90	1,846,718.90	1,846,718.90	1,846,718.90	1,846,718.90	1,846,718.90	1,846,718.90	1,846,718.90	1
Net Cash Flow			**(55,401,567.00)**	**5,831,771.96**	**5,831,771.96**	**5,831,771.96**	**5,831,771.96**	**5,831,771.96**	**5,831,771.96**	**5,831,771.96**	**5,831,771.96**	**5,831,771.96**	**5,831,771.96**	5

Discount Rate	%	12%
NPV	R$	(R$ 9,593,988.99)
IRR	%	8%

CARBON CREDITS	UNIT		0	1	2	3	4	5	6	7	8	9	10	
Validation Costs	R$	15,000.00	15,000.00											
Verrification Costs	R$	15,000.00		15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	
Emission Reduction	k tCO2e	94												
CER Price	R$/tCO2e	32												
Income	R$	3,045,600		3,045,600.00	3,045,600.00	3,045,600.00	3,045,600.00	3,045,600.00	3,045,600.00	3,045,600.00	3,045,600.00	3,045,600.00	3,045,600.00	3
Carbon Credits Cash Flow			**(15,000.00)**	**3,030,600.00**	**3,030,600.00**	**3,030,600.00**	**3,030,600.00**	**3,030,600.00**	**3,030,600.00**	**3,030,600.00**	**3,030,600.00**	**3,030,600.00**	**3,030,600.00**	3,
Project Cash Flow			**(55,416,567.00)**	**8,862,371.96**	**8,862,371.96**	**8,862,371.96**	**8,862,371.96**	**8,862,371.96**	**8,862,371.96**	**8,862,371.96**	**8,862,371.96**	**8,862,371.96**	**8,862,371.96**	8,

Discount Rate	%	12%
NPV	R$	R$ 7,153,931.13
IRR	%	15%

CER price US$	15
Exchange R$ x US$	2.16

Grid Emission Factor Calculation

The grid emission factor calculation was performed in accordance with the latest version of ACM0002. Rondônia-Acre system is isolated from Brazilian interconnected systems S-SE-CO and N-NE. The grid is predominantly thermal thus the Simple OM method was selected.

All data used to calculate the Emission Factor are from the following sources:

1. Data obteined from CERON from report "RELATÓRIO MENSAL - ENERGIA SUPRIDA", years 2001 to 2005
2. Data from TERMONORTE report to CERON
3. Data obteined from CERON from report "RESUMO DE GERAÇÃO TÉRMICA", years 2001 to 2005
4. Data from Programa Mensais de operação para o ano de 2004, http://www.eletrobras.com.br/EM_Atuacao_SistIsolados/default.asp
5. personal comunication with CERON for 2004 data
6. Aneel BIG
7. Data from Programa Mensais de operação para o ano de 2005, http://www.eletrobras.com.br/EM_Atuacao_SistIsolados/default.asp
8. Data from Plano Anual de Operação 2005, pág. 9, item 3.3
9. Data obteined from ELETRONORTE from report "Mapa Oleo Diesel", years 2003 to 2005
10. Data obteined from ELETRONORTE from report "Relatório Integrado do Desempenho Empresarial" (RIDE), years 1994 to 2005
11. Data from GTON2 Brazilian Annual Operational Plan- 2002-2005 - ELETROBRAS;
12. Data from GTON Brazilian Monthly Operational reports-2002-2005 - ELETROBRAS;

A summary of the calculation is provided below.

Table 16 - Data used to calculate EF

	2003		2004		2005	
	Total Generation (MWh)	Fuel Consumption (m³)	Total Generation (MWh)	Fuel Consumption (m³)	Total Generation (MWh)	Fuel Consumption (m³)
PIE Rovema	-	-	-	-	3.053	852
Rio Branco	-	-	328	0	38.136	0
Cabixi II	23.577	0	23.577	0	12.828	0

[2] Grupo Técnico Operacional da Região Norte (Technical Group from Brazilian North Region).

Termonorte II	605.716	187.695	994.041	284.548	989.079	352.776
Monte Belo	23.652	0	23.652	0	26.920	0
PCH Altoe	7.595	0	7.928	0	8.709	0
Alta F. D'Oeste	25.935	0	26.908	0	26.467	0
PCH ST. Luzia	22.077	0	23.293	0	21.030	0
Termonorte I	310.426	74.737	257.014	61.292	439.150	104.242
PCH Cachoeira	55.440	0	57.970	0	60.087	0
PCHs Castaman 2	2.688	0	2.968	0	3.044	0
PCH Cabixi 1	16.639	0	16.435	0	18.281	0
Rio Acre	23.927	8.271	0	0	0	0
PCHs Castaman 3	7.955	0	8.785	0	9.012	0
Rio Branco II	9.055	2.838	23.907	7.355	41.207	12.613
PCHs Castaman 1	8.063	0	8.704	0	9.133	0
Samuel	831.738	0	727.499	0	650.627	0
PCH Rio Vermelho	9.276	0	14.193	0	15.369	0
Rio Madeira	43.684	14.144	42.748	13.504	76.784	24.514
Rio Branco I	92.255	30.455	164.510	55.970	152.514	51.424
Barro Vermelho	157.031	45.806	5.899	1.753	0	0
UTE Colorado	9.386	3.176	8.591	2.885	6.419	2.191
UTE Vilhena	16.489	4.866	19.813	5.978	20.996	6.145

Table 17 - EF calculation summary

Rondonia-Acre System					
	EF_{OM} (tCO_2/MWh)	Load (MWh)	Lambda		
2003	0,8338	2.302.605	Not necessary		
2004	0,8325	2.458.762	Not necessary		
2005	0,9316	2.628.846	Not necessary		
	TOTAL	7.390.213			
	$EF_{OM,SIMPLE}$	0,8682	w_{OM}	0.5	
	$EF_{BM,\ 2005}$	0,9889	w_{BM}	0.5	
	EF_y(tCO2/MWh)	0,9285			

Table 18 - Grid predominance

	2001	2002	2003	2004	2005	Average
Thermal Generation	578,565	875,330	1,267,971	1,516,522	1,729,201	**1,193,518**
Hydro Generation	1,022,173	855,439	1,034,635	942,240	899,645	**950,826**
Predominance	Hydro	Thermal	Thermal	Thermal	Thermal	**Thermal**

Grid selection

According to Bosi (2000), the Brazilian Electricity System is divided in three separate subsystems:

(i) The South/South-east/Midwest Interconnected System;
(ii) The North/North-East Interconnected System; and
(iii) The Isolated System (which represents 300 locations that are electrically isolated from the interconnected systems.

The proposed project activity will be connected to the Rondônia-Acre isolated system (Figure 2), and according to the approved methodology ACM0002, it is necessary to account all generating sources serving the system. As a result, the project proponent should research all power plants serving this system.

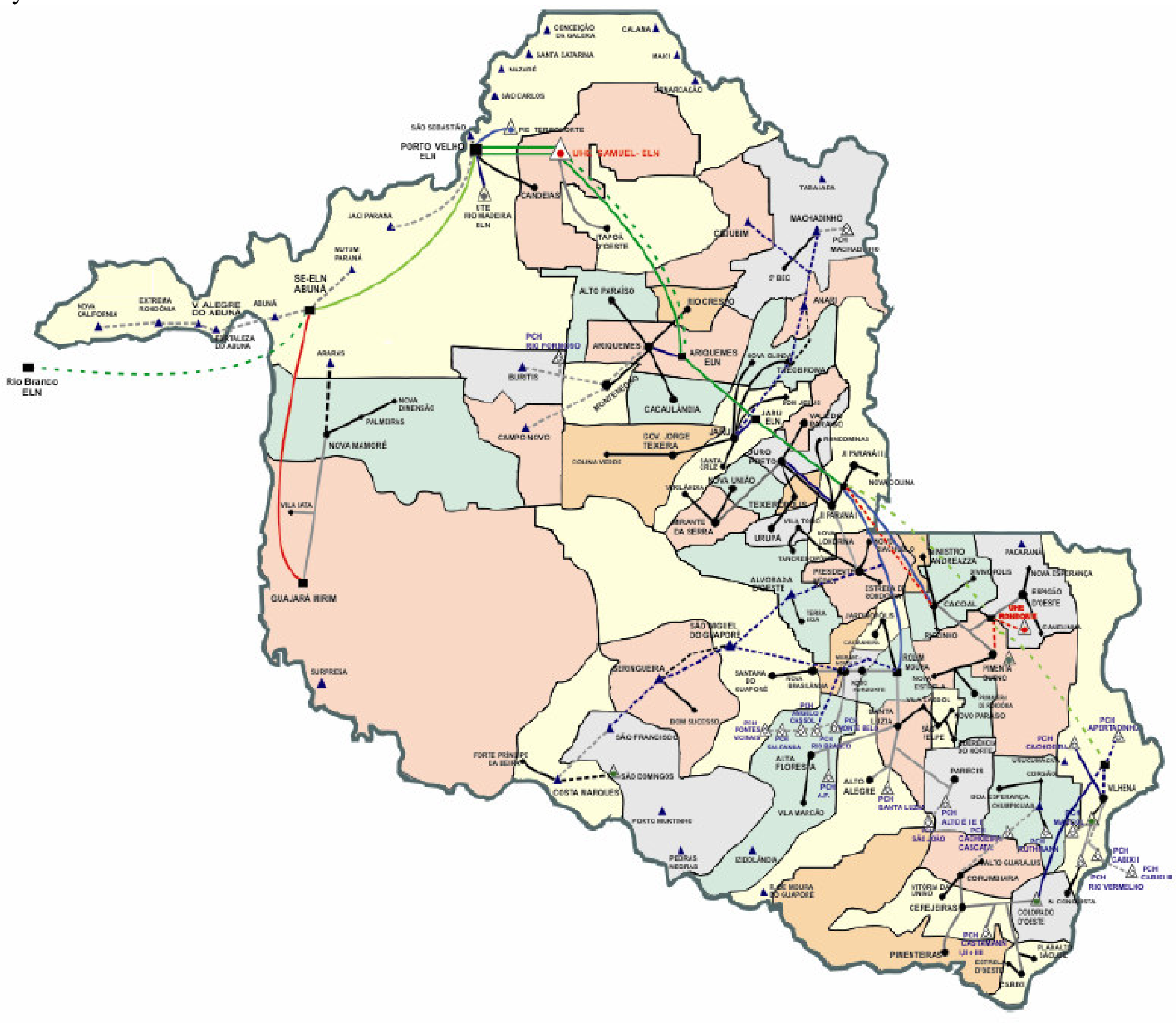

Figure 2 – Rondonia isolated systems (Source: Eletrobras, Annual Operational Plan 2003)

Annex 4

MONITORING INFORMATION

All background information used in the application of the monitoring methodology has been provided in section B.7 above.

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